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REVIEW OF THE SPRINKLER SYSTEM REQUIREMENTS OF THE NOVA SCOTIA BUILDING CODE REGULATIONS

Prepared for:

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1.0 EXECUTIVE SUMMARY

This report has been commissioned by Service Nova Scotia and Municipal Relations to:

- Review the differences between the Nova Scotia Building Code Regulations (NSBCR) sprinkler requirements and the National Building Code (NBC) sprinkler requirements, and
- Make recommendations to either adopt NBC version in its entirety or recommend amendments to the NSBCR.

Data for the review was gathered from stakeholders, jurisdictions outside of Nova Scotia, fire loss statistics and National Research Council (NRC) documents.

The stakeholders that responded generally agreed that some change to the regulations is required but were split between adoption of the NBC and revisions to the NSBCR.

Recommendations have therefore been presented as either:

- Adopt the NBC in its entirety, or
- Revise the NSBCR as follows:
    - Exclude basements from definition of building height,
    - Exclude low hazard industrial buildings up to certain sizes from requiring sprinklers,
    - Exempt buildings required to be sprinklered by the NSBCR but not by the NBC from requiring a fire detection and alarm system,
    - Waive area of refuge requirements in sprinklered buildings, and

This report has not addressed the issue of the impact the NSBCR will have on objective based codes being developed by NRC and vice versa.

2.0 INTRODUCTION

One of the mandates of Service Nova Scotia & Municipal Relations is to administer the Building Code Act and regulations made thereunder. The Act establishes the Nova Scotia Building Advisory Committee (NSBAC) comprised of stakeholders representative of the design and construction industry in the province. Among the responsibilities of the NSBAC is to ensure that the Building Code as adopted and amended in Nova Scotia, is current and reflects the minimum accepted standards for life safety, health, and accessibility in all construction undertaken in the province. Since 1987, the Province of Nova Scotia has adopted the National Building Code (NBC) by Regulation and has adopted amendments to the NBC on a regular basis.

Since 1976, the Province of Nova Scotia has had a Regulation in place for respecting when sprinkler systems are required in buildings. This Regulation was initially adopted by the Office of the Fire Marshal pursuant to the Fire Prevention Act but was moved to the Building Code Regulations made under the Building Code Act. There are contradictions between the sprinkler Regulations and the NBC.

The intent of this study is to determine a means to assure that contradictions between the requirements of the NBC and the Nova Scotia Building Code Regulations (NSBCR) are removed. It is the intent that the two sets of requirements be uniform in their intent and application. It is the intent that this project determine a harmony between these two sets of requirements which will be sustainable given limited resources to maintain the Regulations.

Information used in this review has been obtained from:

- Responses from stakeholders to questionnaires,
- Comments of stakeholders at a meeting held in Halifax on November 28, 2001,
- Supplementary information submitted by stakeholders,
- Literature review of loss statistics, and
- National Research Council documents

3.0 TERMS OF REFERENCE

The Request for Proposals succinctly states the objectives of the study as follows:

- *To analyse the sprinkler requirements of the National Building Code and those currently in force in Nova Scotia under the Nova Scotia Building Code Regulations and make recommendations to either adopt the NBC version in its entirety, or recommend amendments to eliminate the inconsistencies, redundancies, and conflicts. Such amendments should include proposals to address related requirements of the NFC, in addition to those directly impacted.*

4.0 HISTORY OF NOVA SCOTIA BUILDING CODE REGULATIONS (NSBCR)

The first issue of the sprinkler regulations was made under the Fire Prevention Act on January 1, 1976.

The sprinkler regulations were developed and adopted in response to a perception that the NBC at the time was lacking adequate sprinkler requirements.

Shortly after initially being adopted, the regulations were amended to include basements as a storey in the determination of building height. This was intended to address concerns with the modification of grades during construction.

The sprinkler regulations were originally administered by the Nova Scotia Office of the Fire Marshal. In 1997 enforcement was transferred to the NSBCR under the Building Code Act.

Since 1976, the sprinkler requirements in the NBC have become applicable to a greater number of buildings across all occupancy classifications. The most notable of these are all buildings greater than six storeys in height (except open air parking garages up to 22 m in height) and all Group B institutional buildings.

A detailed comparison of the 1975 NBC and 1995 NBC sprinkler requirements is noted in the following table.

		Storeys	1	2	3	4	5	6	Over 6
Category	Examples	Streets+	Building area above which sprinklers required						
A-1	Theatres	1							
A-2	General Assembly	1	1600	800					
		2	2000	1000					
		3	2400	1200					
A-3	Arenas	1	4000	2000					
		2	5000	2500					
		3	6000	3000					
A-4	Grandstands	1	In occupied spaces below seating areas						
B-1	Prisons	1							
B-2	Hospitals	1							
C	Residential	1		6000	4000				
		2			5000				
		3			6000				
D	Offices	1		7200	4800	3600	2880	2400	
		2			6000	4500	3600	3000	
		3			7200	5400	4320	3600	
E	Stores	1	1500	1200	800				
		2	1500	1500	1000				
		3	1500	1500	1500				
F-1	High hazard industrial	1	800				N/A	N/A	N/A
F-2	Medium hazard industrial	1	1500	1500	1070				
		2	1500	1500	1340				
		3	1500	1500	1500				
F-3	Low hazard industrial	1		7200	4800	3600	2880	2400	
		2		9000	6000	4500	3600	3000	
		3		10800	7200	5400	4320	3600	

+	
	All buildings required to face at least one street
	Sprinklers required by Subsection 3.2.2. of 1995 NBC
1000	No limit on building area without sprinklers
N/A	Upper limit of building area without sprinklers
	Height limit for category exceeded
	Sprinklers required by the 1975 NBC

Note: The 1975 NBC also required sprinkler protection in the basements of buildings A-1, A-2, A-3 and B-2, in basements that extended down more than 1 storey below grade and in storeys containing E, F-1 and restaurants located in high-rise buildings.

5.0 COMPARISON OF SPRINKLER REQUIREMENTS IN THE NATIONAL BUILDING CODE (NBC) AND NOVA SCOTIA BUILDING CODE REGULATIONS (NSBCR)

There are basic differences between the NBC and the NSBCR with respect to requiring sprinkler protection.

These include:

- The NSBCR includes basements in the number of storeys for determining building height.

- The NSBCR does not differentiate between Divisions within an Occupancy Group (i.e. Group F, Division 1; Group F, Division 2; and Group F, Division 3, etc.).

- The NSBCR requires a greater extent of sprinkler protection in buildings undergoing an alteration in that all areas of a building would require sprinkler protection. In the NBC, sprinkler protection could be limited to the floor area undergoing alteration and floors below.

- The NSBCR does not recognize sprinkler protection in lieu of areas of refuge except for upgrading of existing buildings with fast response sprinklers.

A detailed comparison is documented in the report, "Comparison of Sprinkler Requirements of the Nova Scotia Building Code Regulations and the 1995 National Building Code of Canada", dated November 15, 2001 included as Appendix A.

6.0 FIRE LOSS STATISTICS

6.1 General

Fire loss statistics were reviewed in order to determine if there is a correlation between the adoption of the sprinkler regulations under the NSBCR and the following:

- A reduction in fire losses after 1976 compared to pre-1976,
- Lower fire losses than the national average, and
- Lower fire losses than a similar[1] province that has adopted the NBC without amendments.

The fire loss statistics used are compiled by the Council of Canadian Fire Marshals and Fire Commissioners. These are published in the councils Annual Report on Fire Losses in Canada.

Three different 10 year periods were reviewed as follows:

- 1967 – 1976: Pre-NSBCR sprinkler regulations
- 1977 – 1986: Post NSBCR sprinkler regulations
- 1987 – 1996: Most recent data available

The fire loss statistics must be viewed cautiously since the results are dependent upon the level of reporting by each jurisdiction.

The statistics do not break down sprinklered and unsprinklered properties.

[1] New Brunswick is considered to be comparable to Nova Scotia in terms of population and geographic location.

6.2 Loss Statistics

Period	Average Per Capita Dollar Loss		
	National	Nova Scotia	New Brunswick
1967 – 1976	13.35	11.17	13.25
1977 – 1986	34.70	29.12	27.10
1987 – 1996	40.55	26.57	25.0

Period	Death Rate[2]		
	National	Nova Scotia	New Brunswick
1987 – 1996	1.6	2.8	2.3

Period	Injury Rate[2]		
	National	Nova Scotia	New Brunswick
1987 – 1996	12.9	6.7	8.9

[2] Death rate and injury rate are the number of deaths per 100,000 population per annum and the number of injuries per 100,000 population per annum.

6.3 Discussion

The loss statistics indicate that for the periods reviewed Nova Scotia has had a lower per capita dollar loss due to fire than the national average. The difference from the national average was identical (about 84% of the national average) for the10 year periods prior to and immediately following the adoption of the sprinkler regulation under the Fire Prevention Act.

For the last 10 year period studied, the per capita dollar loss of Nova Scotia dropped to about 66% of the national average.

The increase in per capita dollar loss for each of the10 year periods is likely due to improved reporting of fire losses and inflation.

However, the Nova Scotia dollar loss statistics are similar to New Brunswick which adopts the NBC without amendments.

It should be noted that nationally in 1996 residential occupancies accounted for 40.7% of all reported fires, 46% of the total dollar loss due to fire, 71% of the total number of injuries due to fire, and 78% of the total number of deaths due to fire.

In Nova Scotia in 1996 residential occupancies accounted for 64.2% of all reported fires and 75.6% of the total dollar loss due to fire. No statistics were available for injuries and deaths.

The death and injury rates are likely[3] primarily due to residential fires in one and two family residences that are not subject to the sprinkler regulations of the NSBCR.

[3] Based on Table 3(b) of the 1996 Annual Report on Fire Losses in Canada.

7.0 STAKEHOLDER RESPONSES

7.1 General

As part of the public consultation process, stakeholders were solicited for responses to specific questions regarding the sprinkler regulations.

Three different questionnaires were developed for the following groups:

1. Provincial representatives responsible for legislation of Codes outside of Nova Scotia.
2. Insurance industry representatives.
3. All stakeholders not included in 1 and 2.

A total of 55 responses were received from a total of about 300 solicited.

A number of stakeholders also submitted supplemental comments by letter.

The responses have been summarized in Appendices B, C and D.

7.2 Analysis

7.2.1 Jurisdictions Outside of Nova Scotia

The jurisdictions that responded to the questionnaire are noted in the table below. This table summarizes the responses with respect to the sprinkler requirements in those jurisdictions.

Jurisdiction	Sprinkler Requirements		
	Same as NBC	Less than NBC	More than NBC
British Columbia	✓[4]		
Alberta			✓[5]
Saskatchewan		✓	
Northwest Territories	✓		
Ontario		✓	
Quebec		✓	
New Brunswick	✓		
Yukon	✓		
Nunavut			✓

It should also be noted that although they did not respond, it is the authors understanding that the provinces of Manitoba and Newfoundland and Labrador have the same sprinkler requirements as the NBC. Prince Edward Island varies in terms of sprinkler requirements being the same as the NBC in some areas and lesser requirements in others where NFPA-101, Life Safety Code is used.

[4] Municipalities in British Columbia are permitted to pass By-Laws with more restrictive requirements.
[5] Alberta Regulations require all Part 3 residential buildings to be sprinklered and require professional engineers to design and certify sprinkler systems.

A majority of the provincial/territorial jurisdictions (10 of 13) have sprinkler requirements that are either the same as or less than the NBC. Two (Alberta and Nova Scotia) jurisdictions have sprinkler requirements that are more than the NBC.

7.2.2 Insurance Industry

The two responses from the insurance industry indicated that generally insurance premiums are lower for a sprinklered building than an unsprinklered building, all other things being equal.

The actual decline in premium is dependent upon: the type of construction, the hazard of the occupancy, the loss history and market conditions.

The fact that insurance premium savings can be realized by installing and maintaining a sprinkler system is acknowledged.

The true economic benefit to be derived however can only be determined through a detailed cost/benefit analysis taking into account not only the initial capital costs of a sprinkler system but also ongoing inspection, testing and maintenance costs.

7.2.3 Other Stakeholders

The responses to the key questions, questions 10 and 11 were essentially evenly split.

A breakdown of the responses to these questions by stakeholder industry sector is noted below.

Question 10: Are the sprinkler requirements of the NSBCR too restrictive?			
Industry Sector	Yes	No	Not Sure
Building Owner/Operator	4		1
Architect	3	1	
AHJ (fire)	1	2	
AHJ (building)	8	4	1
Contractor	1	9	2
Special Interest	1	1	1
Engineer		2	
Totals	**18**	**19**	**5**

Question 11: Should the sprinkler requirements of the NSBCR be revised so as to be consistent with those of the NBC 1995?			
Industry Sector	Yes	No	Not Sure
Building Owner/Operator	4		1
Architect	3	1	
AHJ (fire)		3	
AHJ (building)	9	2	2
Contractor	1	9	2
Special Interest	2		1
Engineer		2	
Totals	**19**	**17**	**6**

Additional comments offered by the Authorities Having Jurisdiction (AHJ) both building and fire tended to suggest that the NSBCR sprinkler regulations are too restrictive particularly with respect to smaller residential buildings and low hazard industrial buildings.

Even amongst those AHJ's that stated the NSBCR sprinkler regulations should be retained there were recommendations that they be revised to address the concerns noted in the above paragraph.

The contractors, all of who but one are affiliated with the sprinkler industry, were most adamant that the sprinkler regulations of the NSBCR not be revised to be consistent with the NBC.

The general opinion of the contractors is that Nova Scotia is a leader in this area and that from a life safety standpoint, the requirements for sprinkler protection should not be reduced. A suggestion offered by the contractors is to permit additional trade-offs for sprinklers. No specific trade-offs however were suggested.

8.0 ECONOMIC CONSIDERATIONS

There are a number of different sectors that can be considered with respect to economic considerations related to sprinkler protection in buildings. For the purposes of this report, discussions are limited to the insurance and business sectors as these were the two that were solicited for input.

8.1 Insurance

There was limited response from the insurance industry to the questionnaires under this study.

The respondents indicated that underwriting methods are complex but generally offer the opinion that insurance premiums will generally be lower for a sprinklered building versus an unsprinklered building of similar use, height, area, and age.

The underwriters also indicated during the stakeholders meeting that in their opinion, a major benefit with respect to a greater number of buildings being sprinklered, would be to the municipalities in terms of receiving superior underwriting ratings. This however could not be quantified.

8.2 Business

As with the insurance industry, there was limited response from the business community to the questionnaires.

One of the stakeholders from private business stated that in a competitive economic environment, the increased capital and maintenance costs represented by the more stringent sprinkler requirements in Nova Scotia can create a competitive disadvantage for Nova Scotia based businesses.

It was stated that this was particularly so in rural areas where providing adequate water supplies for sprinkler systems can have a significant impact on the cost of a project, particularly on small to medium sized buildings where the cost of the water supply for sprinkler systems would represent a greater percentage of the overall capital cost.

The issue of water supplies in rural areas was considered by NRC as not requiring sprinkler protection in smaller buildings.

8.3 Government

In order to maintain a true consensus based code and retain the sprinkler requirements, the provincial government would have to provide additional resources to administer this process, strike committees with balanced stakeholder representation, maintain communications with stakeholders and the general public and support staff technical research efforts.

The National Building Code is a consensus based code supported and developed by the National Research Council with public involvement on committees and the review process of proposed changes.

8.4 Other Sectors

It is acknowledged that there are other sectors that would have economic considerations. These would include the cost to municipalities with respect to maintaining minimum fire fighting capabilities and water supplies, health costs associated with injuries resulting from fires, and socioeconomic issues with respect to loss of major employers due to fire in smaller communities.

Responses by stakeholders to the question of whether in their opinion sprinkler protection would reduce property taxes was generally no, taxes would not be reduced.

9.0 RECOMMENDATIONS

The author's opinion which is supported by the stakeholder responses is that the regulations require change. The degree to which change is required in the opinion of the stakeholders is evenly split between adoption of the NBC and revisions to the NSBCR.

The following recommendations are presented on a preferred basis in order to provide options to the NSBAC.

1. Adopt the NBC in its entirety. This recommendation is based on;

    - Only one other jurisdiction besides Nova Scotia has adopted the NBC with more sprinkler amendments. The differences are limited to Part 3 residential buildings and professional engineer involvement in design and construction review,
    - The loss statistics of Nova Scotia with the NSBCR sprinkler regulations are comparable to New Brunswick which uses the NBC without amendment,
    - Since the NSBCR sprinkler regulations were adopted in 1976 the NBC has been revised to require a significantly greater number of buildings to be sprinklered and,
    - The greatest number of fires, deaths and injuries by occupancy type and provincially occur in small (one and two family residences, apartments, tenement and flats)[6] to which the NSBCR sprinkler regulations do not apply.
    - A majority of the stakeholders who opposed changing the sprinkler requirements of the NSBCR represent sprinkler contractors.
    - There will likely be a cost to government to continue to maintain the sprinkler regulation amendments in a consensus based code environment.
    - As the NBC is revised the sprinkler amendments of the NSBCR will have to be reviewed for potential conflicts.
    - As the NBC moves to objective-based codes, intent statements for each requirement will be developed. The author was not able to obtain any documentation regarding the intent of the sprinkler regulations when they were adopted in 1976. Government will have to research and review this issue in order to develop intent statements for the NSBCR sprinkler regulations.

[6] 1996 Annual Report on Fire Losses in Canada

2. Revise the NSBCR as follows:

- Revise the definition of building height to exclude basements as a storey contributing to building height.

  Including basements as storeys increased the number of buildings regulated under Part 9 of the Code to require sprinkler protection. However there is no documentation that the author has seen to support that this was the intent of including basements as a storey contributing to building height.

- Exclude low hazard industrial occupancies from requiring sprinkler protection for building heights and areas consistent with those of Group F, Division 3 buildings not requiring sprinkler protection in the NBC.

- Exempt buildings that are required to be sprinklered by the NSBCR but not by the NBC from requiring a fire detection and alarm system.

- Include a reference to Article 3.3.1.7. of the NBC in Section 3.8 of the NSBCR regarding areas of refuge being waived in a sprinklered building.

  This reference may have been overlooked when the NSBCR Section 3.8 was substituted for Section 3.8 of the NBC.

  The NSBCR is particularly onerous in Group B, Division 2 buildings that are required to be sprinklered in all cases by the NBC and are also required to be designed with a high degree of compartmentation for non-ambulatory persons.

APPENDIX A

November 15, 2001 Report

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COMPARISON OF SPRINKLER REQUIREMENTS OF THE NOVA SCOTIA BUILDING CODE REGULATIONS AND THE 1995 NATIONAL BUILDING CODE OF CANADA

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1.0 INTRODUCTION

The following report outlines the differences between the National Building Code of Canada 1995 (NBC) and the Nova Scotia Building Code Regulations, 1997 (NSBCR) in terms of the requirements for the installation of automatic sprinkler systems. The NSBCR affects Part 3 and Part 9 of the NBC.

2.0 COMPARISON OF NBC AND NSBCR REQUIREMENTS

The major differences between the requirements and application of the NSBCR and the NBC are identified below.

2.1 Storeys Determining Building Height

NBC

The following definitions from the NBC are applicable in defining building height in terms of storeys:

Basement – *means a storey or storeys of a building located below the first storey.*

Building Height (in storeys) – *means the number of storeys contained between the roof and the floor of the first storey.*

First Storey – *means the uppermost storey having its floor level not more than 2 m above grade.*

Grade (as applicable to the determination of building height) – *means the lowest of the average levels of finished ground adjoining each exterior wall of a building, except that localized depressions such as for vehicle or pedestrian entrances need not be considered in the determination of average levels of finished ground (See First storey).*

The NBC definition of storey refers to the portion of a building from floor level to floor level. Sprinkler requirements for buildings are based on building height, not including basement and area.

A basement is determined by establishing an average grade of finished ground at the exterior walls of the building. The uppermost storey with its floor level not more than 2 m above grade is the first storey. All levels or storeys below this are considered basement.

The NBC permits artificial grades to be created through the use of berms. This application is often used to reduce the number of storeys in building height. This may eliminate the need for a sprinkler system as well as permit combustible construction instead of non-combustible construction.

NSBCR

The first issue of the NSBCR effective January 1, 1976, also used building height (storeys above grade) to determine sprinkler requirements. This was amended however due to final grades around buildings not always being as indicated on the approved plans which was impractical to change at that stage for compliance.

Consequently, the current NSBCR references storeys when dictating sprinkler requirements, which includes all levels of the building, above or below grade, except mezzanines.

This eliminates the need of having to determine grade for purposes of establishing building height.

Note that the 1995 NBC addresses sprinklering of basements as a separate issue in Articles 3.2.1.5. and 3.2.2.15., and that this information was contained in the NBC prior to 1976 when the sprinkler regulation became effective.

2.2 Building Classifications

The NSBCR classifies buildings into six Occupancy Groups:

Group A – Assembly buildings.
Group B – Institutional buildings. This group includes people who are legally incarcerated and those in medical facilities.
Group C – Residential buildings.
Group D – Business and personal services buildings.
Group E – Mercantile buildings.
Group F – Industrial buildings.

The NBC uses the same occupancy group classifications, although these groups are further separated into Divisions in order to further clarify their actual use.

The Divisions are as follows:

Group A:

Division 1 – Includes theatres (both movie and live) as well as television studies admitting a viewing audience.
Division 2 – Includes schools, community halls, restaurants, courtrooms, licensed beverage establishments, museums, and passenger stations.

Division 3 – Includes arenas, swimming pools with spectator seating, and rinks.

Division 4 – Includes open-air stadia, grandstands, reviewing stands and bleachers.

Group B:

Division 1 – Includes penitentiaries and other legal confinements.

Division 2 – Includes hospitals, nursing homes, and convalescent homes.

Group F:

Division 1 – Includes high hazard industrial uses such as paint manufacturing, chemical manufacturing, flour and feed mills, and spray painting operations.

Division 2 – Includes medium hazard uses such as auto repair garages, aircraft hangers, woodworking factories and printing plants.

Division 3 – Includes low hazard uses such as storage (parking) garages, storage rooms, and warehouses.

These divisions provide a more definitive description of the intended use of a building. This enables the construction requirements to better reflect the actual occupant loads, occupant profiles, and intended use.

Based on these Divisions, the NBC has required sprinkler systems in buildings considered to be a higher risk for the occupants and emergency responders based on size, use and occupant load.

The NSBCR does not address these differing Divisions and as such does not recognize the varying degrees of fire hazard within the occupancy groups.

2.3 Comparison of Sprinkler Requirements

The following compares the NBC and NSBCR sprinkler requirements for each occupancy classification. Note that for NBC requirements, building areas are based on facing three streets unless otherwise indicated. Also, the reference to storeys in the NBC column does not include basements. Basements are included in the reference to storeys in the NSBCR.

2.3.1 Group A – Assembly

NBC	NSBCR
Division 1 • All buildings require sprinklers. **Division 2** All buildings having a building height of: • Three or more storeys • Two storeys exceeding 1,200 m^2 • One storey exceeding 2,400 m^2 require sprinklers **Division 3** **Non-combustible Construction:** All buildings having a building height of: • Three or more storeys • Two storeys exceeding 3,000 m^2 • One storey exceeding 6,000 m^2 require sprinklers **Combustible Construction:** All buildings having a building height of: • Two or more storeys • One storey exceeding 3,600 m^2 require sprinklers	No Divisions. All buildings containing: • Four or more storeys • Three storeys exceeding 465 m^2 • Two storeys exceeding 929 m^2 • One storey exceeding 1,394 m^2 require sprinklers

NBC	NSBCR
Division 4 • No requirements for sprinklers except when areas below tiers of seats are occupied, and if the seating area is enclosed by glazing.	

2.3.2 Group B – Institutional

NBC	NSBCR
Division 1 • All buildings require sprinklers. **Division 2** • All buildings require sprinklers.	No Division breakdown. All buildings containing: • Three or more storeys • Two storeys exceeding 465 m^2 • One storey exceeding 929 m^2 require sprinklers

2.3.3 Group C – Residential

NBC	NSBCR
All buildings four or more storeys require sprinklers. **Non-combustible Construction:** All buildings having a building height of: • Three storeys exceeding 6,000 m^2 • Two storeys exceeding 6,000 m^2 unless there is fire fighting access to at least 50% of the building perimeter require sprinklers	Requirements apply to buildings consisting of either combustible and/or non-combustible construction. All buildings containing: • Four or more storeys (except buildings containing one or two family dwelling units having a building area less than 232 m^2) • Three storeys exceeding 465 m^2 • Two storeys exceeding 929 m^2 or • One storey exceeding 1,394 m^2 require sprinklers

NBC	NSBCR
Combustible Construction: All buildings having a building height of: • Three storeys exceeding 1,200 m^2 • Two storeys exceeding 1,800 m^2 • One storey exceeding 3,600 m^2 require sprinklers	

2.3.4 Group D – Business and Personal Services

NBC	NSBCR
All buildings seven storeys or more require sprinklers. **Non-combustible Construction:** All buildings having a building height of: • Six storeys exceeding 3,600 m^2 • Five storeys exceeding 4,320 m^2 • Four storeys exceeding 5,400 m^2 • Three storeys exceeding 7,200 m^2 • Two storeys exceeding 7,200 m^2 unless there is fire fighting access to at least 50% of the building perimeter require sprinklers **Combustible Construction:** All buildings having a building height of: • Three storeys exceeding 2,400 m^2 • Two storeys exceeding 3,600 m^2 • One storey exceeding 7,200 m^2 require sprinklers	Requirements apply to buildings consisting of either combustible and/or non-combustible construction. All buildings containing: • Four or more storeys • Three storeys exceeding 929 m^2 • Two storeys exceeding 1,858 m^2 • One storey exceeding 2,788 m^2 require sprinklers

2.3.5 Group E – Mercantile

NBC	NSBCR
All buildings having a building height of: • Four storeys or more • One to three storeys exceeding 1,500 m^2 require sprinklers	All buildings containing: • Four or more storeys • Three storeys exceeding 465 m^2 • Two storeys exceeding 929 m^2 • One storey exceeding 1,394 m^2 require sprinklers

2.3.6 Group F – Industrial

NBC	NSBCR
Division 1 – High Hazard All buildings more than one storey or exceeding 800 m^2 require sprinklers. **Division 2 – Medium Hazard** All buildings having a building height of: • Four storeys or more • Up to three storeys exceeding 1,500 m^2 require sprinklers **Division 3 – Low Hazard** All buildings seven storeys or more require sprinklers.	Applies to all construction types. All buildings containing: • Three or more storeys • Two storeys exceeding 929 m^2 • One storey exceeding 1,394 m^2 require sprinklers The NSBCR also permits the Authority Having Jurisdiction to require a sprinkler system or any other fire suppression system in any Group F building which may constitute a special fire hazard by reason of use or occupancy.

NBC	NSBCR
Non-combustible Construction: All buildings having a building height of: • Six storeys exceeding 3,600 m^2 • Five storeys exceeding 4,320 m^2 • Four storeys exceeding 5,400 m^2 • Three storeys exceeding 7,200 m^2 • Two storeys exceeding 10,800 m^2 require sprinklers **Combustible Construction:** All buildings having a building height of: • Four storeys exceeding 1,800 m^2 • Three storeys exceeding 2,400 m^2 • Two storeys exceeding 3,600 m^2 • One storey exceeding 8,400 m^2* require sprinklers *** Heavy Timber Construction:** • One storey buildings can be up to 8,400 m^2 without sprinkler protection, if fire fighting access is provided to 75% of the building perimeter **Parking Garages:** Open-air non-combustible parking garages up to 22 m high and 10,000 m^2 in building area are not required to be sprinklered.	

2.4 Additions to Existing Buildings

The NSBCR requires that if an alteration (addition) to a building constructed prior to January 1, 1976 is required to have a sprinkler system by either the NSBCR or the NBC, such system must be extended into the original building, or a firewall must be constructed between the existing structure and the proposed addition.

Any alteration (addition) to a building constructed prior to January 1, 1976 would therefore be treated on its own merits as to whether or not a sprinkler system was required.

The NSBCR requires that if an alteration (addition) is carried out in a building constructed after January 1, 1976, the entire building would be subject to sprinkler requirements.

The NBC states that on any storey in a building that requires the installation of a sprinkler system, due to an alteration, the system is required to also be installed on all floors below the one on which it is required.

3.0 SUMMARY

There are basic differences between the NSBCR and the NBC with respect to requiring sprinkler protection.

These include:

- Including basements in the number of storeys.
- Differentiating between Divisions within an Occupancy Group (i.e. Group F, Division 1, Group F, Division 2, Group F, Division 3, etc.).
- Extent of sprinkler protection required in a building undergoing renovation.

APPENDIX B

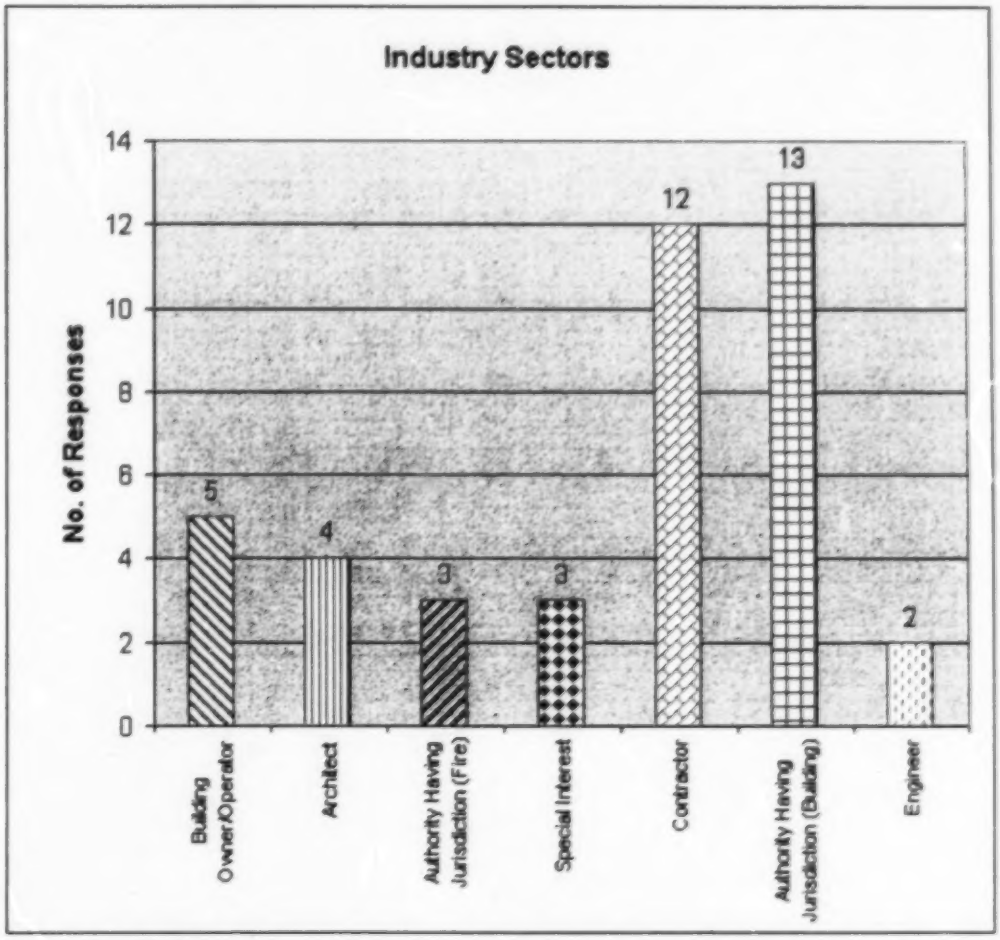
Questionnaire 1: Provincial Representatives Responsible for Legislation of Codes Outside of Nova Scotia

APPENDIX C

Questionnaire 2: Insurance Industry Representatives

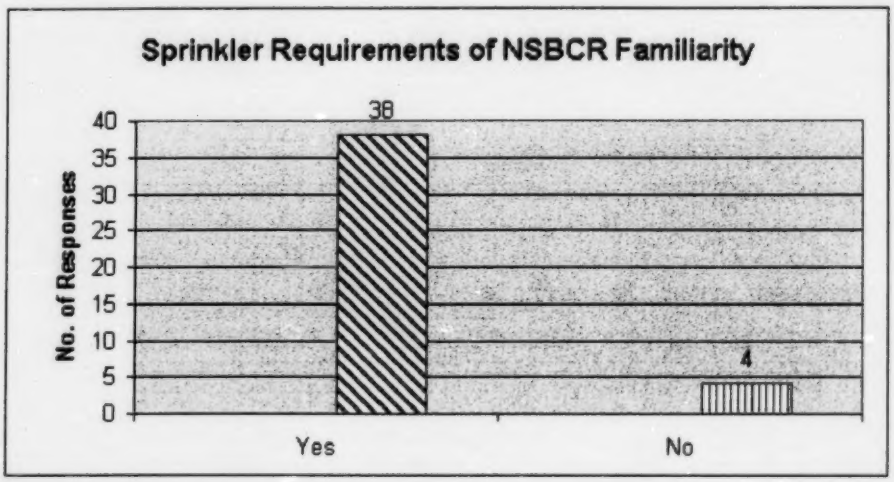
APPENDIX D

Questionnaire 3: General. All Stakeholders not Identified in Questionnaires #1 and #2



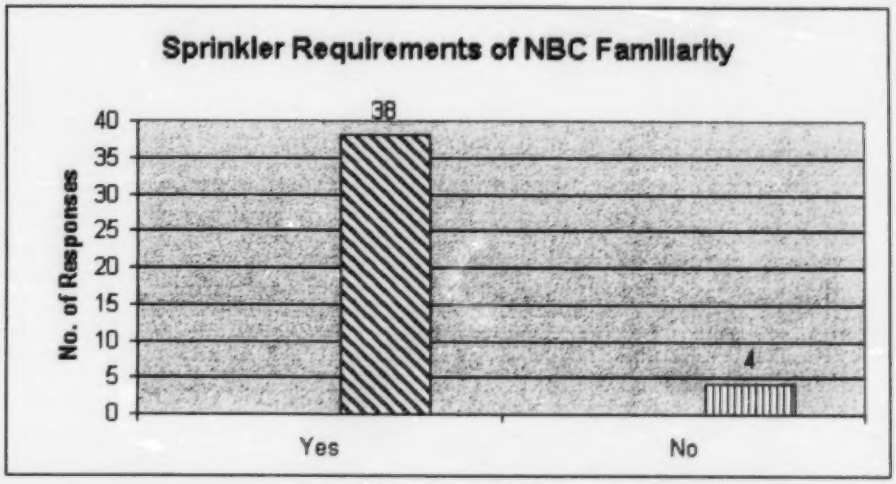
Which of the following sectors does your organization practice in or represent?

Building Owner/Operator
Architect
Authority Having Jurisdiction (Fire)
Special Interest
Contractor
Authority Having Jurisdiction (Building)
Engineer



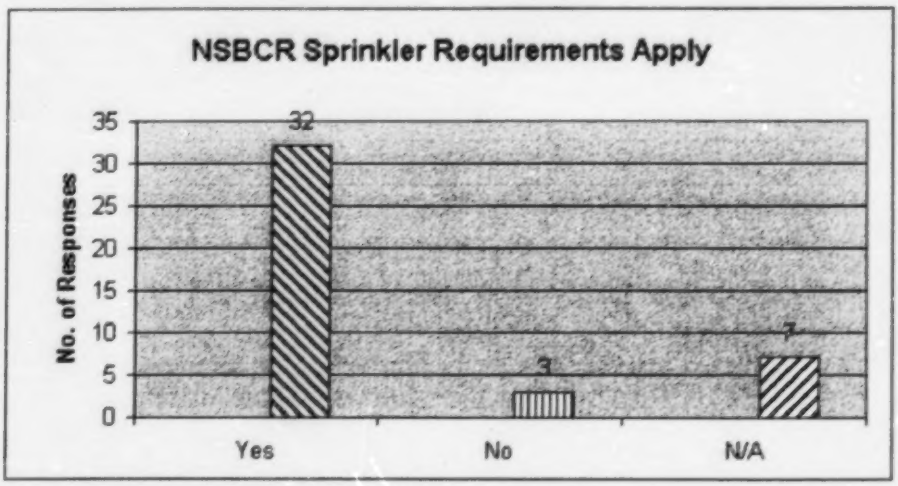
Are you familiar with the sprinkler requirements of the Nova Scotia Building Code Regulations (NSBCR)?

Yes
No



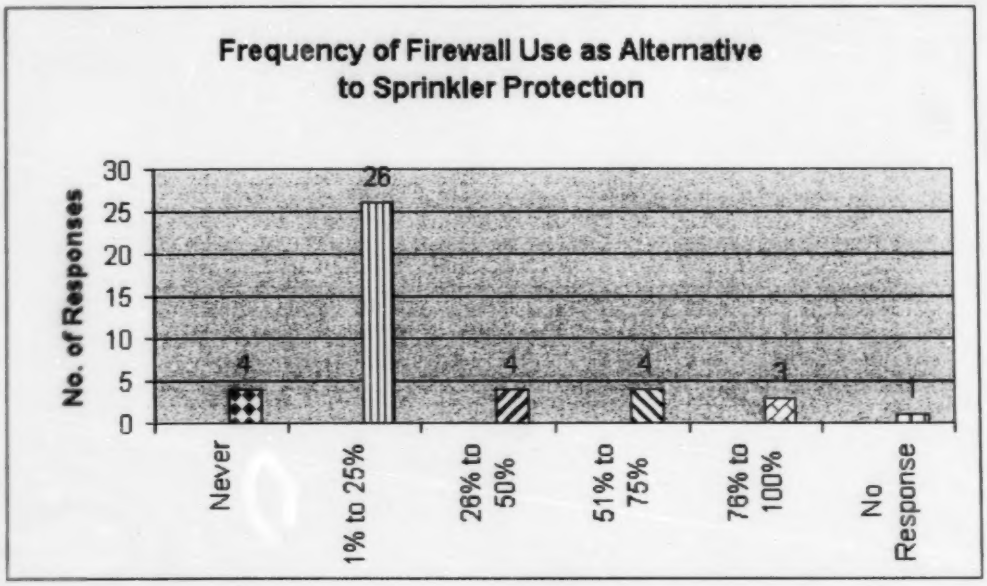
Are you familiar with the requirements for sprinkler systems in the National Building Code of Canada 1995?

Yes
No



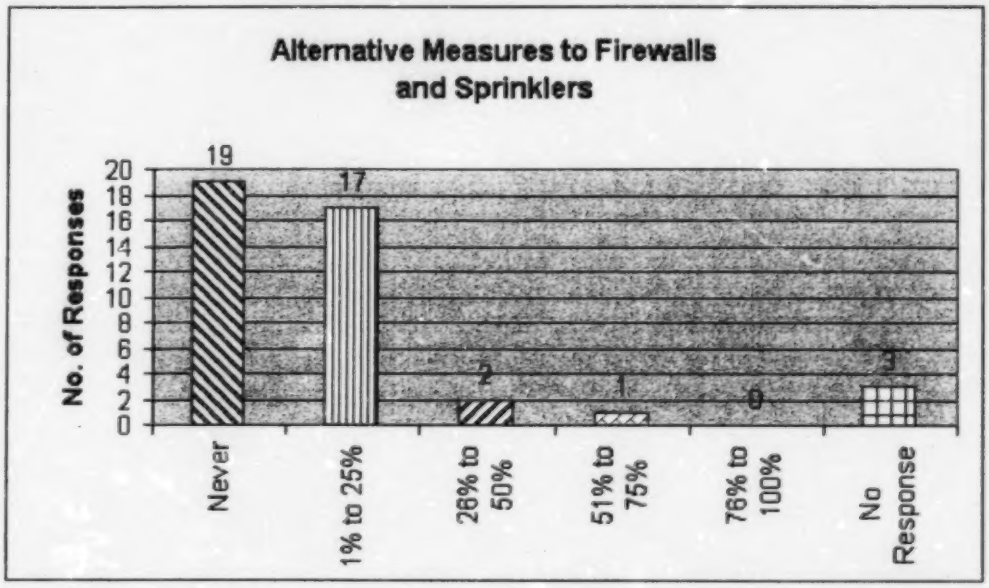
Do the more stringent sprinkler requirements of the Nova Scotia Building Code Regulations apply to the buildings in your domain?

Yes
No
N/A



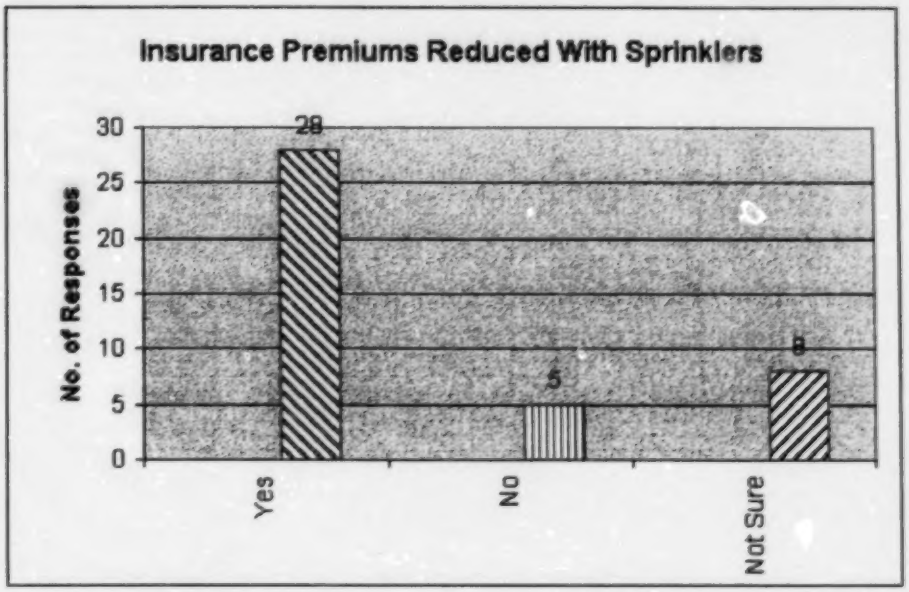
In your experience, with which of the following ranges of frequency are firewalls used as an alternative to sprinkler protection (i.e. limit building area) on projects?

Never
1% to 25%
26% to 50%
51% to 75%
76% to 100%



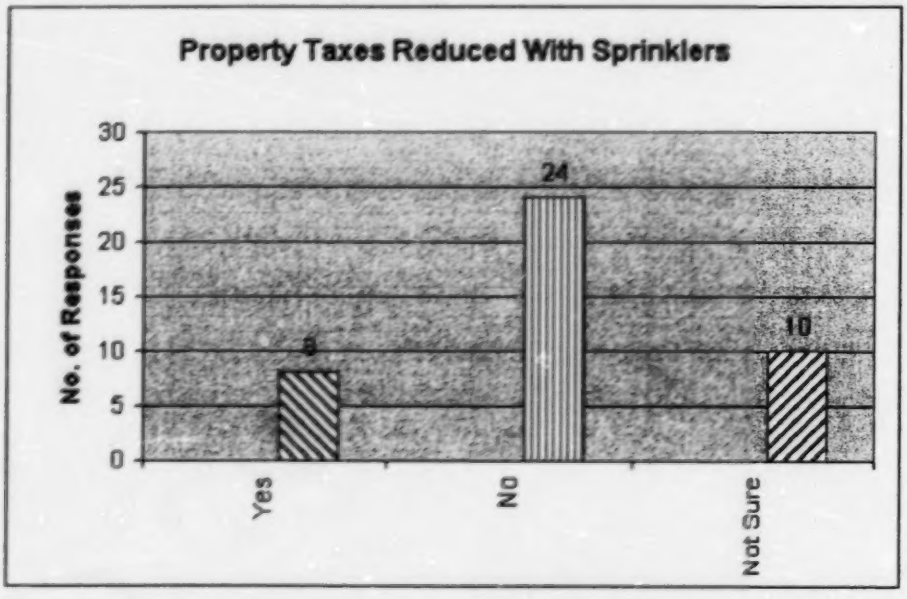
In your experience, with which of the following ranges of frequency are alternative measures (equivalencies) to firewalls and sprinklers used on projects?

Never
1% to 25%
26% to 50%
51% to 75%
76% to 100%



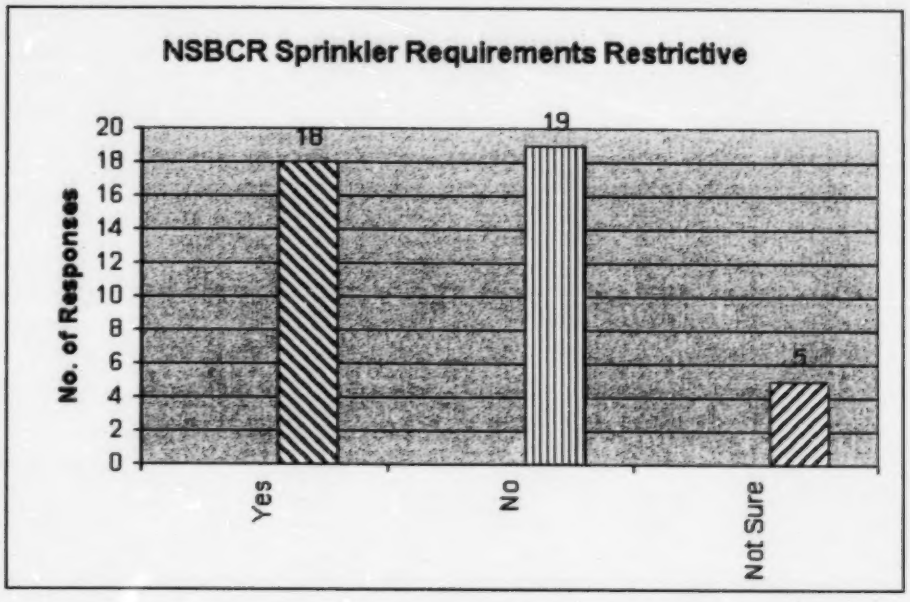
Does sprinkler protection, in your opinion, reduce insurance premiums?

Yes
No
Not Sure



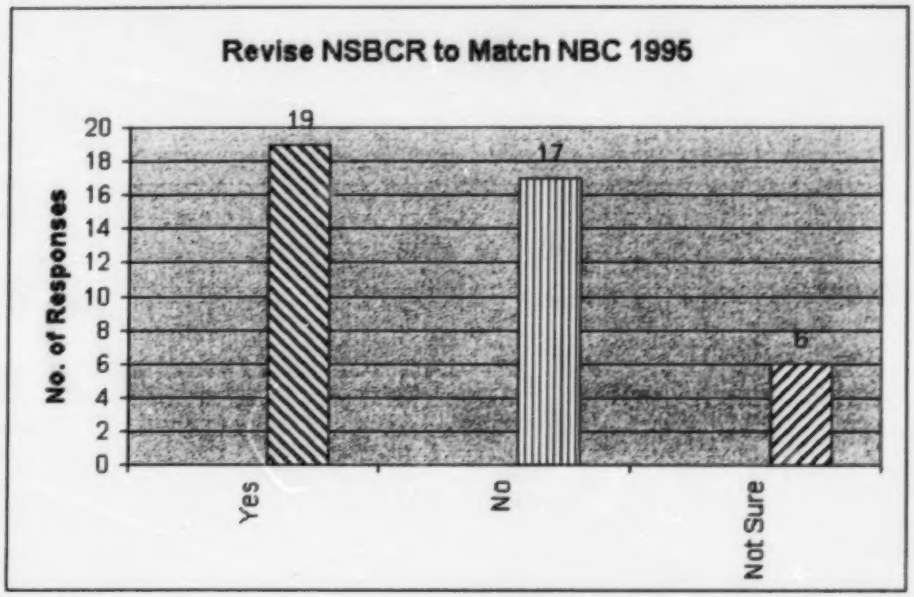
Does sprinkler protection, in your opinion, reduce property taxes?

Yes
No
Not Sure



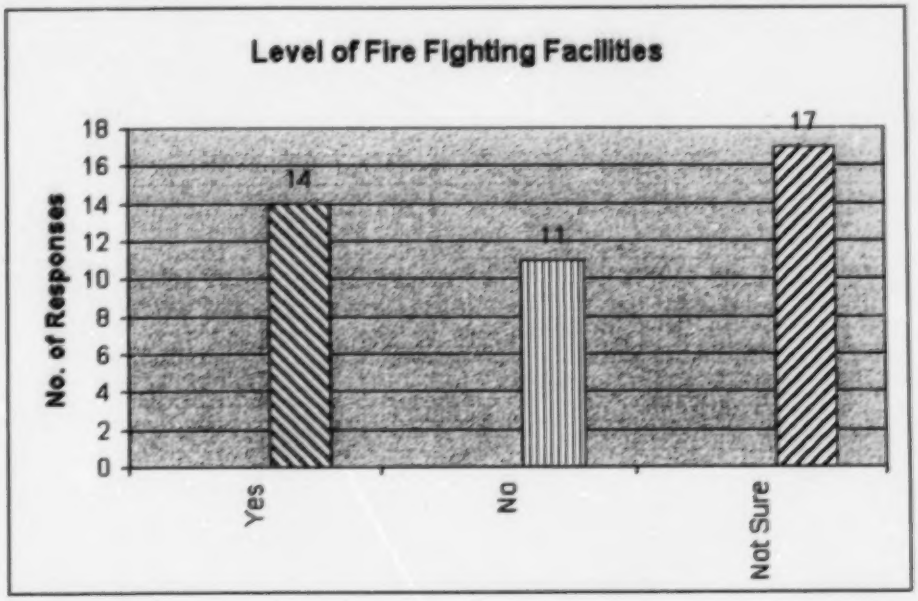
In your opinion, are the sprinkler requirements of the Nova Scotia Building Code Regulations too restrictive?

Yes
No
Not Sure



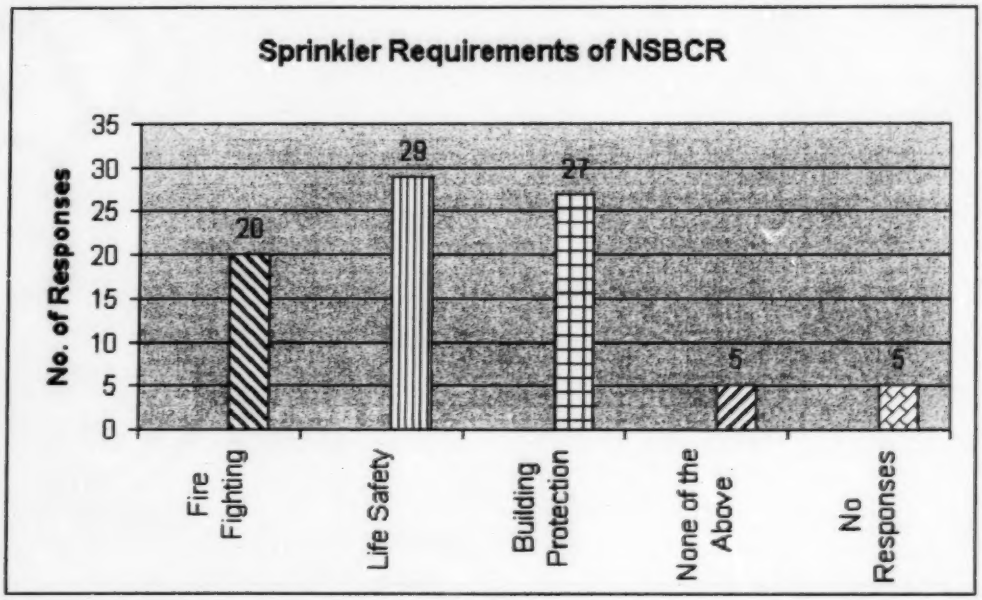
In your opinion, should the sprinkler requirements of the Nova Scotia Building Code Regulation be revised so as to be consistent with those of the National Building Code 1995?

Yes
No
Not Sure



In your opinion, is the basic level of fire fighting facilities in the Province of Nova Scotia consistent with that assumed to be available by the National Building Code 1995?

Yes
No
Not Sure



In your opinion, are the sprinkler requirements of the NSBCR necessary for:

Fire Fighting
Life Safety
Building Protection
None of the Above